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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,131	07/25/2001	Shohhei Fujio	JP920000229	2739

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IBM MICROELECTRONICS
INTELLECTUAL PROPERTY LAW
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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 12/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,131

Applicant(s)

FUJIO ET AL.

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 3, 2003 has been entered. An action on the RCE follows.

Response to Amendment

2. Applicant's amendment filed on August 4, 2003 has been received and entered in the case.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 – 7, 10, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitsuyoshi (JP '666).

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Regarding claim 1, Mitsuyoshi discloses in Fig. 1 and page 3, sections 0013 - 0015 a semiconductor integrated circuit device comprising:

- a die (11) connected to a ground lead (any one of 19) and a power lead (19 - 1);
- a ground plane (12) connected to the ground lead;
- an electrically insulating layer (13) which electrically isolates said die and said ground plane;
- a decoupling capacitor (14) having a first end and a second end, the first end connected to the ground plane and the second end connected to the power lead; and
- an encapsulating material (16) which encapsulates the die and the ground plane.

Regarding claim 2, Mitsuyoshi discloses in Fig. 1 said ground plane being adjacent a first plane of a printed circuit board for mounting electronic parts.

Regarding claim 3, Mitsuyoshi discloses in Fig. 1 said ground plane extending in two dimensions beyond the edges of said die.

Regarding claim 4, Mitsuyoshi discloses in Fig. 1 an intra-package wiring substrate (12 and 15) comprising wirings (17) for a connecting path between the ground and power leads, bonding pads of the die being disposed between the die and the ground plane, and the decoupling capacitor (14) being connected to the ground plane at one end and the power line of the intra-package wiring substrate at the other end.

Regarding claim 5, Mitsuyoshi discloses in Fig. 1 the portion of the encapsulating material (16) for inserting the power lead being connected to a power supply bonding pad of the die (11) through a bonding wire (17) at the die-side end, and the first end of the decoupling

capacitor (14) being connected to the ground plane (12) and the second end of the decoupling capacitor being connected to the specified location of said portion for inserting the power lead.

Regarding claim 6, Mitsuyoshi discloses in Fig. 1 the specified location of the portion for inserting the power lead to which the decoupling capacitor is connected is the die-side end of the portion for inserting the power lead.

Regarding claim 7, Mitsuyoshi discloses in Fig. 1 the ground plane being connected to the die-side end of the portion for inserting the power lead into the encapsulating material.

Regarding claim 10, Mitsuyoshi discloses in Fig. 1 an electronic apparatus or control apparatus comprising a semiconductor integrated circuit device according to Claim 1. See the rejection of claim 1.

Regarding claim 11, Mitsuyoshi discloses the electrically insulating layer comprising one of air, encapsulating material or bonding material.

Regarding claim 14, Mitsuyoshi discloses in Fig. 1 the encapsulating material encapsulating the decoupling capacitor and the electrically insulating layer.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuyoshi in view of An et al. '874.

Mitsuyoshi discloses the claimed invention except for a layer of material having a lower dielectric constant than the dielectric constant of the encapsulating material. However, An et al. teaches in Fig. 4 and column 3, line 3 – line 13 a layer of polyimide material (130) and an epoxy encapsulating material (360). Since polyimide has a dielectric constant of ~3.4 which is lower than that of epoxy (~3.9), the layer of polyimide material (130) in An et al. has a lower dielectric constant than the dielectric constant of the encapsulating material (360). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to use a layer of material having a lower dielectric constant than the dielectric constant of the encapsulating material, within the '666 invention, as taught by An et al. The ordinary artisan would have been motivated to do so because these particular materials were conventionally used for these respective structures.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuyoshi in view of Hernandez et al. '818.

Mitsuyoshi discloses the claimed invention except for an external decoupling capacitor provided on the printed circuit electrically connected in parallel with the decoupling capacitor of the semiconductor integrated circuit device. However, Hernandez et al. teaches an external decoupling capacitor (60) provided on the printed circuit (68 and see Fig. 10B). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Mitsuyoshi by including an external decoupling capacitor provided on the printed circuit electrically connected in parallel with the decoupling capacitor of the semiconductor integrated circuit device as taught by Hernandez et al. The ordinary artisan would have been motivated to

modify Mitsuyoshi in the manner described above depending only upon conventional considerations such as the specific circuit or device in which the package is desired to be integrated.

8. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuyoshi in view of Hundt '717.

Regarding claims 12 and 13, regardless of whether Mitsuyoshi expressly discloses that the ground plane may be composed of a metal or specifically copper, Hundt teaches in column 5, lines 52 ~ 57 a ground plane (90) comprising a layer of metal, specifically copper. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to employ metal, specifically copper, for the ground plane of Mitsuyoshi as taught by Hundt. The ordinary artisan would have been motivated to do so for at least the purpose of ensuring high electrical conductivity, because Cu was conventionally used for lead frames and ground planes because of its high conductivity.

Response to Arguments

9. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

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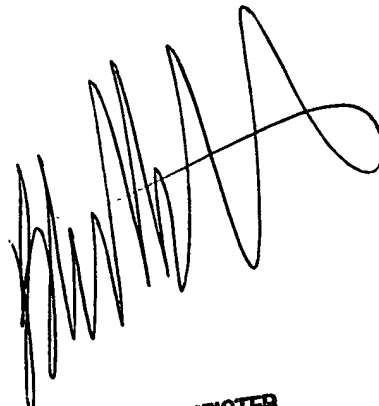
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
12/5/03 11:33:58 AM



BRADLEY BAUMEISTER
PRIMARY EXAMINER